

Application Serial No. 10/701,306
Reply to Office Action of March 23, 2005

PATENT
Docket: CU-3424

Amendments To The Claims

The listing of claims presented below will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1. (currently amended) A clock divider for a DLL (Delay Lock Loop) circuit of a synchronous memory device for synchronization of an external input clock with an internal input clock, wherein the synchronous memory device generates a control signal indicative of the power down condition of the synchronous memory device, the clock divider comprising:

~~M (where M is an integer that is larger than 2)~~ number of dividers connected in series, the serially connected dividers being consecutively referred to as first to M-th dividers,

wherein a first clock signal is inputted to the first divider and the first divider outputs to the second divider a clock signal having half the first clock signal frequency, and

wherein each of the second to M-th divider receives the clock signal outputted from the formerly connected divider and outputs to the subsequently connected divider a clock signal having the frequency that is half the inputted clock signal frequency; and

a power-down controller ~~for~~ receiving the control signal, an output signal of the (M-1)-th divider, and an output signal of the M-th divider, and selectively outputting ~~the an~~ output signals,

~~wherein the respective dividers divide a frequency of a clock signal inputted to~~

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~~the respective dividers into 1/2.~~

2. (currently amended) The clock divider as claimed in claim 1, wherein the output signal of the power-down controller has a frequency obtained by dividing the frequency of the first clock signal inputted to the first divider into $1/2^M$ or $1/2^{(M-1)}$ in accordance with a logic level of a the control signal.

3. (currently amended) The clock divider as claimed in claim 2, wherein ~~if~~ when the logic level of the control signal is in a first state (high level), the output signal of the power-down controller ~~becomes~~ is the output signal of the (M-1)-th divider, and if the logic level of the control signal is in a second state (low level), the output signal of the power-down controller becomes the output signal of the M-th divider.

4. (original) The clock divider as claimed in claim 3, wherein the control signal is a clock enable signal used in the synchronous memory device.

5. (previously presented) The clock divider as claimed in claim 1, wherein a pulse width of a high-level state of the output signal of the first divider is the same as a period of the input signal of the first divider, and a pulse width of a low-level state of output signals of the second to M-th dividers is the same as the period of the input signal of the first divider.

6. (previously presented) The clock divider as claimed in claim 4, wherein the

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power-down controller comprises two transmission gates, and the two transmission gates are selectively turned on/off according to the control signal.

7. (currently amended) In a synchronous memory device having a DLL (Delay Lock Loop) having a clock divider and generating a control signal indicative of the power down condition of the synchronous memory device, the clock divider comprising: M number of dividers connected in series, the serially connected dividers being consecutively referred to as first to M-th dividers, wherein a first clock signal is inputted to the first divider and the first divider outputs to the second divider a clock signal having half the first clock signal frequency, and wherein each of the second to M-th divider receives the clock signal outputted from the formerly connected divider and outputs to the subsequently connected divider a clock signal having the frequency that is half the inputted clock signal frequency, A a clock dividing method for a DLL (Delay Lock Loop) circuit of a synchronous memory device for synchronization of an external input clock with an internal input clock, the method comprising the steps of:

selectively outputting an output signal of a the (M-1)-th divider as the output signal of the clock divider when the control signal is in a first state;

and

outputting an output signal of an M-th divider as the output signal of the clock divider when the control signal is in a second state.

~~among M dividers, connected in series, for respectively dividing a frequency of the input clock signal into 1/2.~~

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8. (previously presented) The clock divider as claimed in claim 2 wherein a pulse width of a high-level state of the output signal of the first divider is the same as a period of the input signal of the first divider, and a pulse width of a low-level state of output signals of the second to M-th dividers is the same as the period of the input signal of the first divider.

9. (previously presented) The clock divider as claimed in claim 8, wherein the power-down controller comprises two transmission gates, and the two transmission gates are selectively turned on/off according to the control signal.

10. (previously presented) The clock divider as claimed in claim 3 wherein a pulse width of a high-level state of the output signal of the first divider is the same as a period of the input signal of the first divider, and a pulse width of a low-level state of output signals of the second to M-th dividers is the same as the period of the input signal of the first divider.

11. (previously presented) The clock divider as claimed in claim 10, wherein the power-down controller comprises two transmission gates, and the two transmission gates are selectively turned on/off according to the control signal.

12. (previously presented) The clock divider as claimed in claim 4 wherein a pulse width of a high-level state of the output signal of the first divider is the same as a period of the input signal of the first divider, and a pulse width of a low-level state of output

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signals of the second to M-th dividers is the same as the period of the input signal of the first divider.

13. (new) The clock divider as claimed in claim 1, further comprising:
a clock buffer part receiving the external input clock, wherein the external input clock passed through the clock buffer part is the first clock signal.

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